

## Innovation in the Sky, Phase II

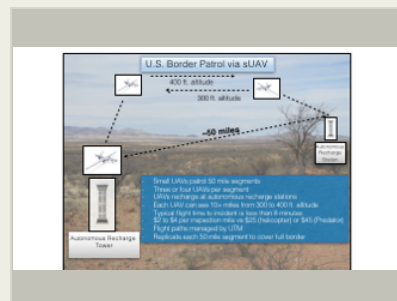
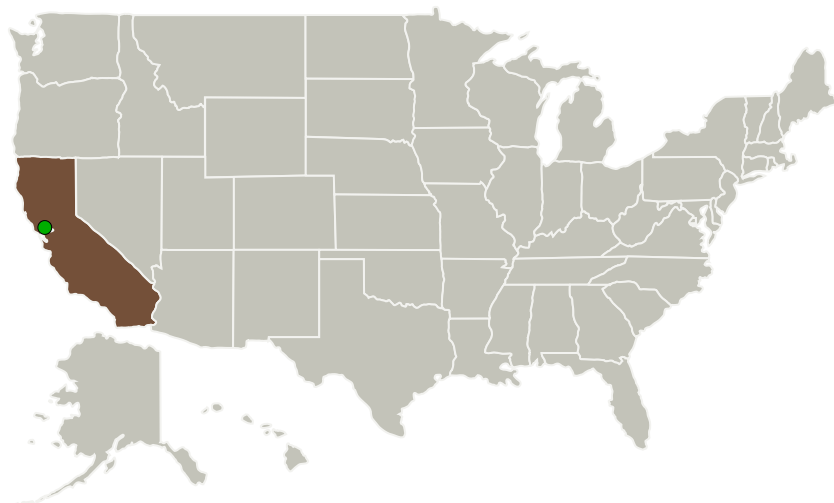
Completed Technology Project (2017 - 2020)



## Project Introduction

This Phase II proposal presents a scope of work to develop reliable Sense and Avoid for BVLOS Unmanned Aerial Vehicle [UAV] operations. We first analyze a) the requirement for avoidance based on the UAV's ability to get away from danger and b) the suite of candidate technologies needed to detect intruders with ample time to get away. To meet this need we will build a reliable FINE TRACKING sensor for knowing where nearby objects are located and an EARLY WARNING sensor for the region outside the coverage of the Fine Tracker. The first step is to substantially improve the candidate sensor technologies [radar, LiDAR and V2V] for our specific requirements. This is because the individual technologies have typically been designed for other markets and on their own will not solve Sense and Avoid. But the combination of our improvements to these three technologies along with smart data fusion will provide meaningful Early Warning and Fine Tracking of any likely intruders. We will then run experiments to verify that we can reliably detect and then avoid our two most challenging targets; namely power lines and toy drones. We will then report on our results and provide recommendations for commercialization.

## Primary U.S. Work Locations and Key Partners



Innovation in the Sky, Phase II Briefing Chart Image

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destination	3

## Innovation in the Sky, Phase II

Completed Technology Project (2017 - 2020)



Organizations Performing Work	Role	Type	Location
Higher Ground	Lead Organization	Industry	Palo Alto, California
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

## Primary U.S. Work Locations

California

## Project Transitions

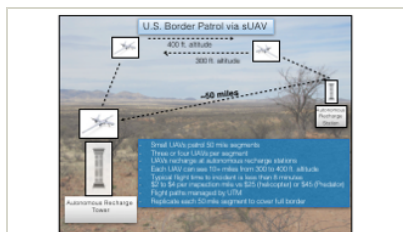
▶ **April 2017:** Project Start

✓ **March 2020:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/141011>)

## Images

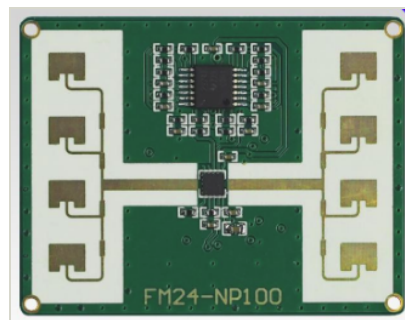


## Briefing Chart Image

Innovation in the Sky, Phase II

Briefing Chart Image

(<https://techport.nasa.gov/image/135976>)



## Final Summary Chart Image

Innovation in the Sky, Phase II

(<https://techport.nasa.gov/image/128507>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

Higher Ground

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

Carlos Torrez

## Principal Investigator:

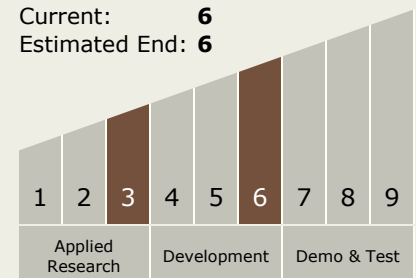
Robert S Reis

## Technology Maturity (TRL)

Start: **3**

Current: **6**

Estimated End: **6**



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### Technology Areas

#### Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - └ TX06.4.2 Fire: Detection, Suppression, and Recovery

### Target Destination

Earth